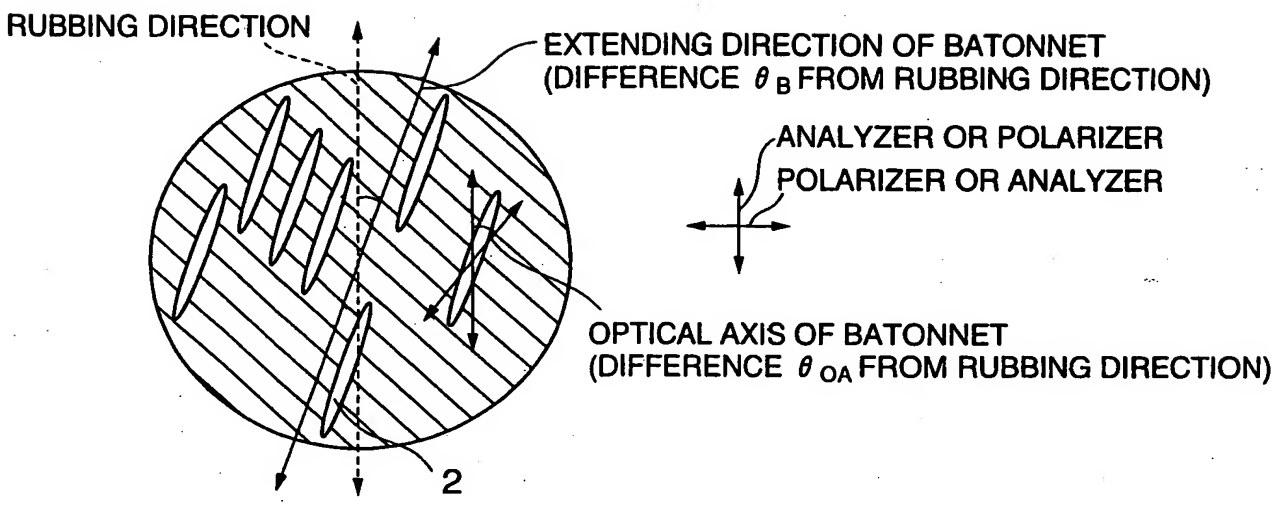


$$|\theta_{OA}-\theta_B| \leqq 1^\circ$$

FIG.1

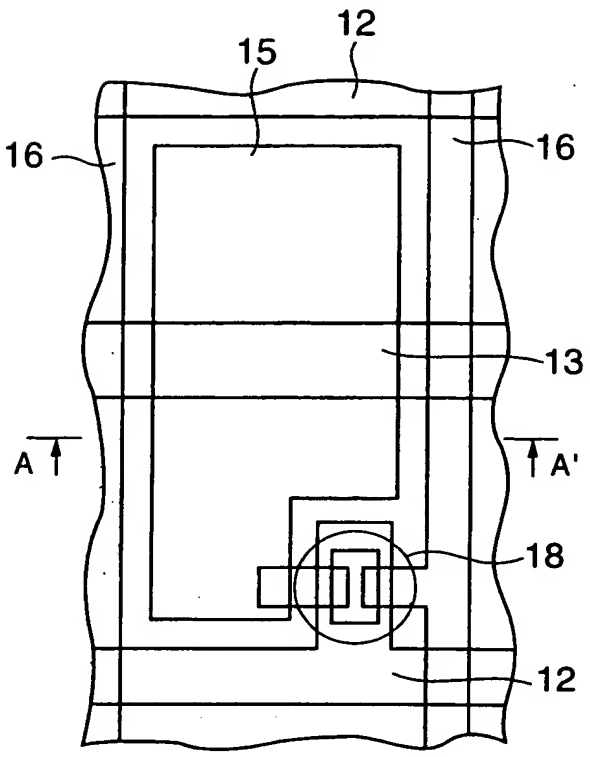
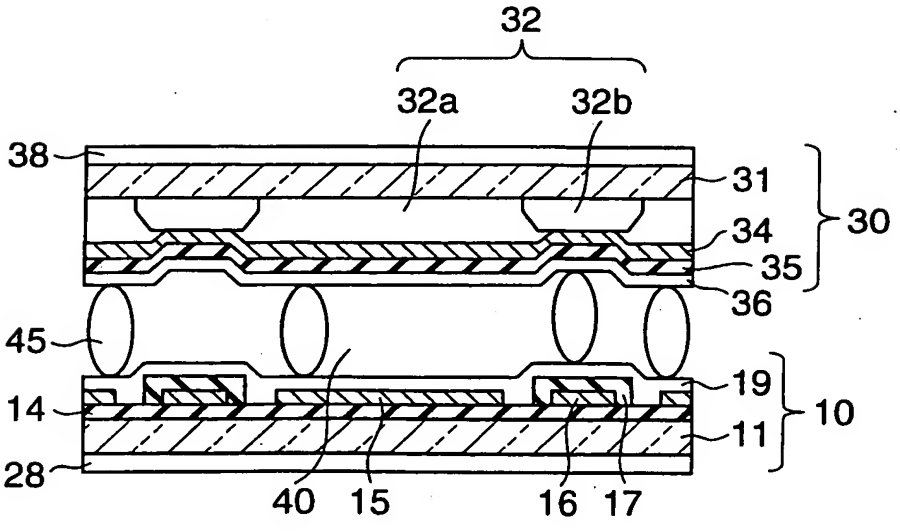


FIG.2A



CROSS SECTION TAKEN ALONG LINE A-A'

FIG.2B

ALIGNMENT LAYERS, CONTACT ANGLES, EXTENDING DIRECTIONS AND OPTICAL AXES OF BATONNET
(ANGLES SHIFTED FROM RUBBING DIRECTION)

STRUCTURES OF PRINCIPAL CHAIN		(1)				(2)					
ALIGNMENT LAYER MATERIAL		A	A+B (2:1)	A+B (1:2)	B	C	D	D+E (2:1)	D+E (1:2)	E	F
SIDE CHAINS		NONE	PRESENCE	PRESENCE	PRESENCE	NONE	PRESENCE	PRESENCE	PRESENCE	PRESENCE	PRESENCE
PRETILT ANGLES IN NEMATIC LIQUID CRYSTAL [°]		1-2			3	1-2	3-4			6-9	90
CONTACT ANGLES[°]	(H2O)	30.0	30.4	31.3	31.2	25.4	26.3	27.0	28.7	30.2	30.4
	(CH2I2)	4.2	5.4	7.5	10.5	5.4	6.2	7.6	10.1	11.5	12.4
① SURFACE TENSION	[dyn/cm]	51.2	50.8	49.7	48.8	54.0	53.1	52.2	50.1	48.5	48.0
② EXTENDING DIRECTION [°] (OPTICAL AXIS [°]) OF BATONNET	a(Ps=210)	5(5)	-(-)	-(-)	7(7)	0(7)	8(8)	-(-)	-(-)	-(-)	-(-)
	b(160)	5(5)	-(-)	-(-)	5(5)	2(7)	5(7)	-(-)	-(-)	-(7)	-(-)
	c(30)	-3(-3)	-(-)	-(-)	-4(-4)	-4(-3)	-3(-4)	-(-)	-(-)	-(-)	-(-)
③ ALIGNMENT CHARACTERISTICS	a(Ps=210)	◎	-	-	○	△	○	-	-	△	※
	b(160)	◎	-	-	×	×	△	-	-	×	※
	c(30)	△	△	○	△	○	○	○	◎	×	※
④ DETERIORATION RATIOS	c(30)	1.7	1.6	1.8	2.0	4.2	1.9	1.8	1.2	1.5	-

FIG.3

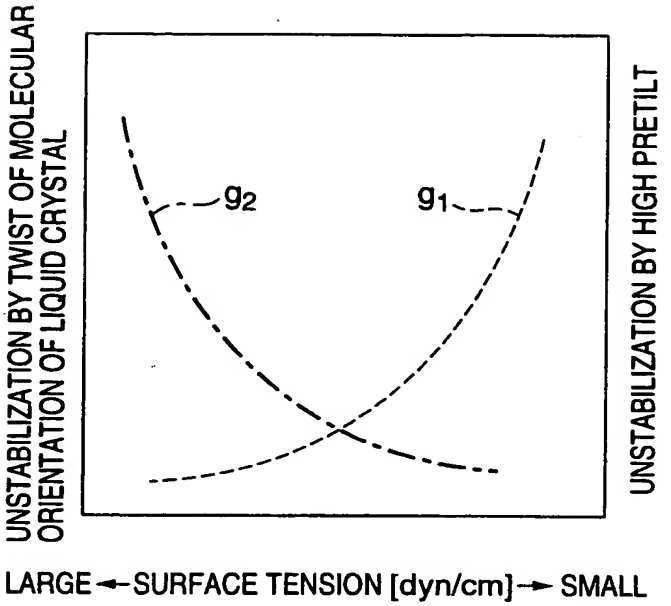

UNSTABILIZATION BY TWIST OF MOLECULAR ORIENTATION OF LIQUID CRYSTAL
g_2
g_1
UNSTABILIZATION BY HIGH PRETILT
LARGE ← SURFACE TENSION [dyn/cm] → SMALL

FIG.4

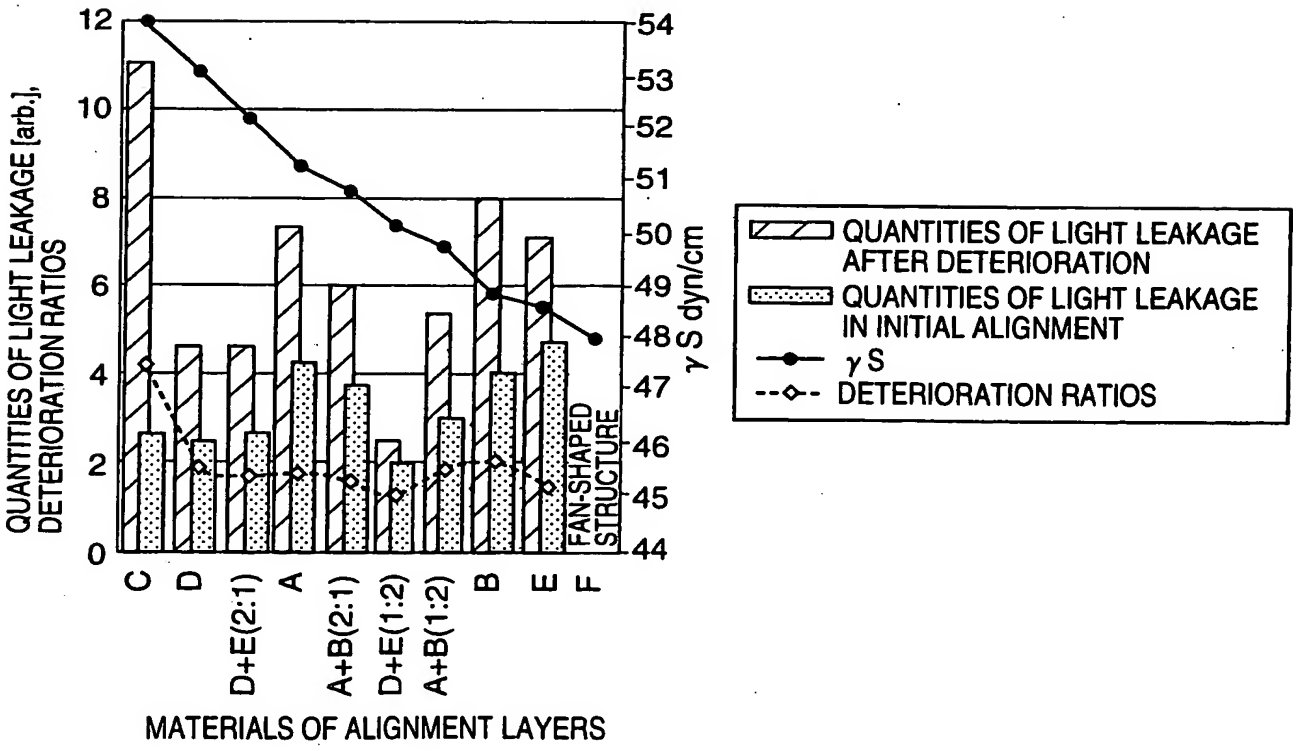

QUANTITIES OF LIGHT LEAKAGE [arb.], DETERIORATION RATIOS
12
10
8
6
4
2
0
54
53
52
51
50
49
48
47
46
45
44
γS dyn/cm
C
D
D+E(2:1)
A
A+B(2:1)
D+E(1:2)
A+B(1:2)
B
E
F
FAN-SHAPED STRUCTURE
MATERIALS OF ALIGNMENT LAYERS
QUANTITIES OF LIGHT LEAKAGE AFTER DETERIORATION
QUANTITIES OF LIGHT LEAKAGE IN INITIAL ALIGNMENT
γS
DETERIORATION RATIOS

FIG.5

REPLACEMENT SHEET

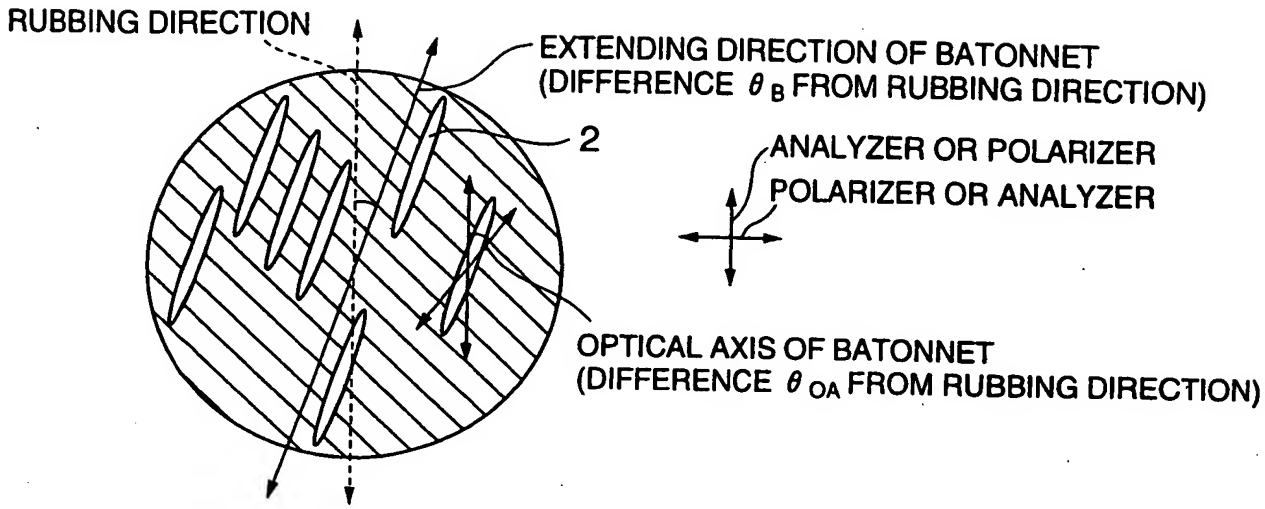


FIG.6

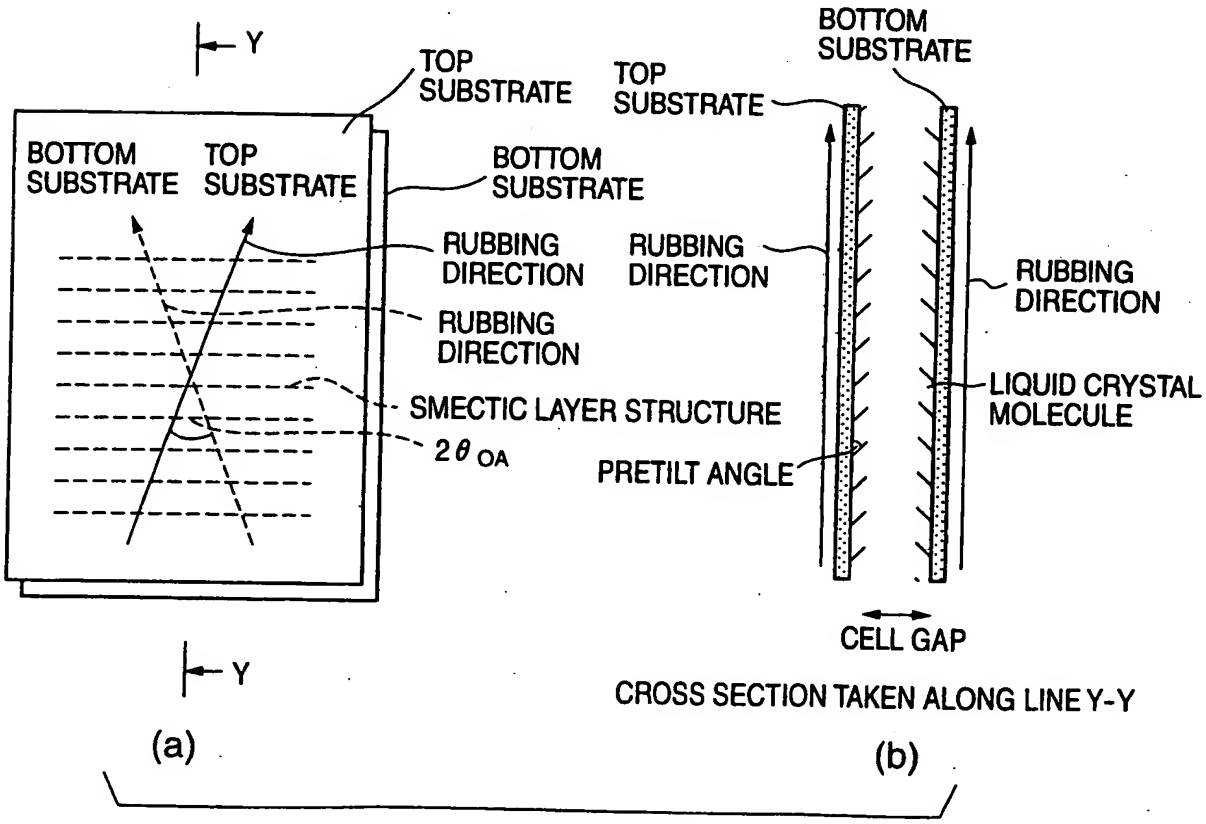


FIG.7

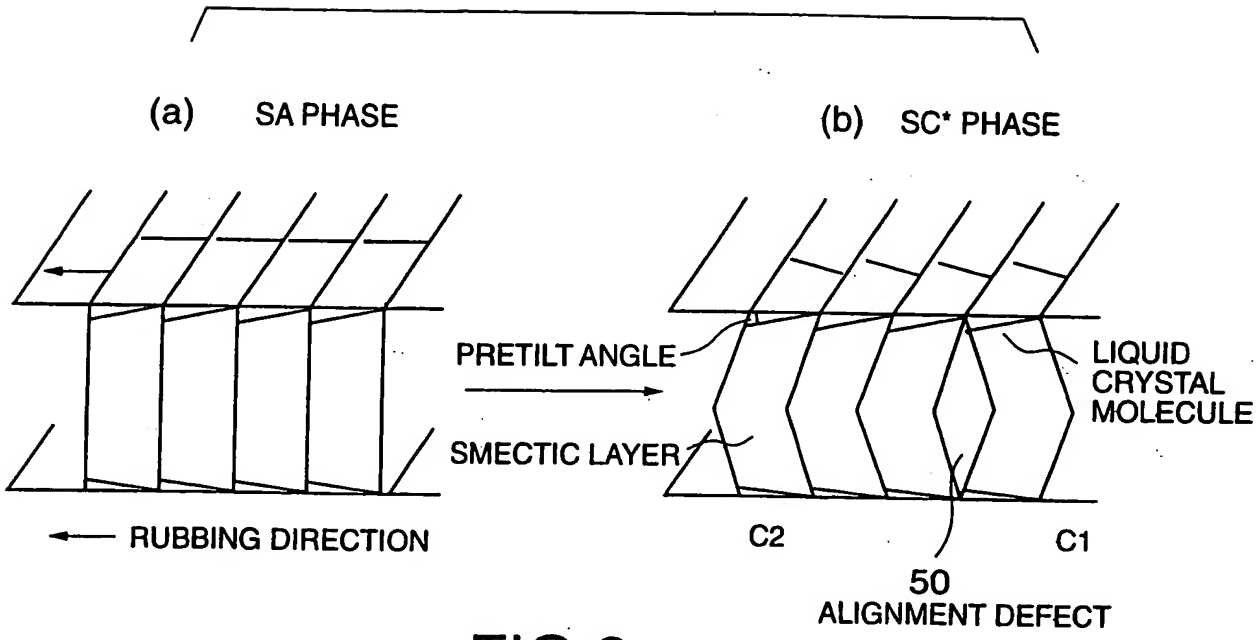

(a) SA PHASE
(b) SC* PHASE
PRETILT ANGLE
SMECTIC LAYER
LIQUID CRYSTAL MOLECULE
RUBBING DIRECTION
C2
C1
50
ALIGNMENT DEFECT

FIG.8

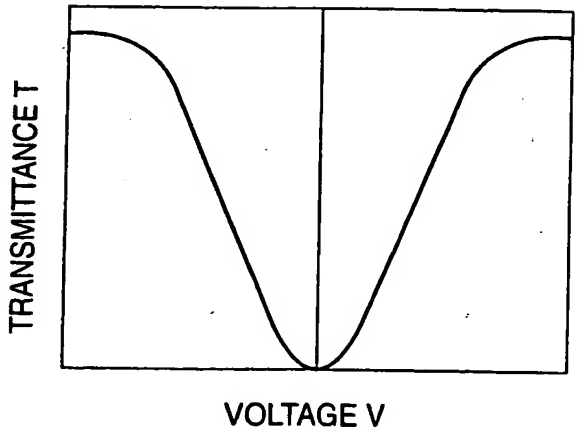

TRANSMITTANCE T
VOLTAGE V

FIG.9

FIG.10A

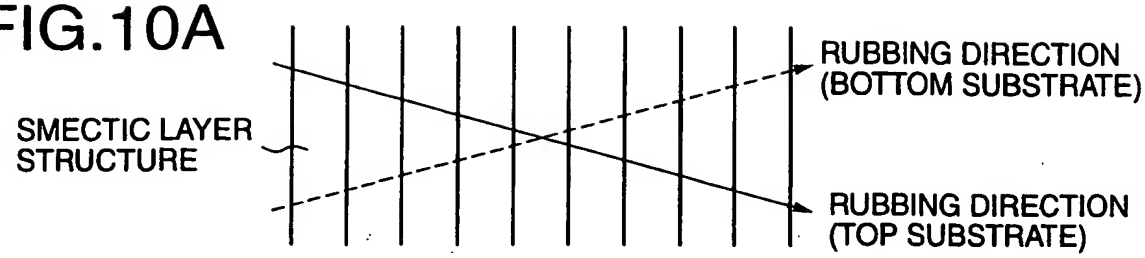


FIG.10B

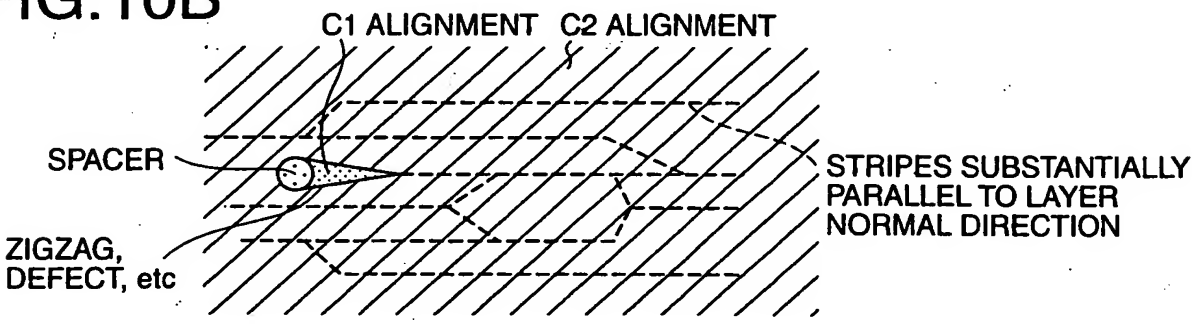


FIG.10C

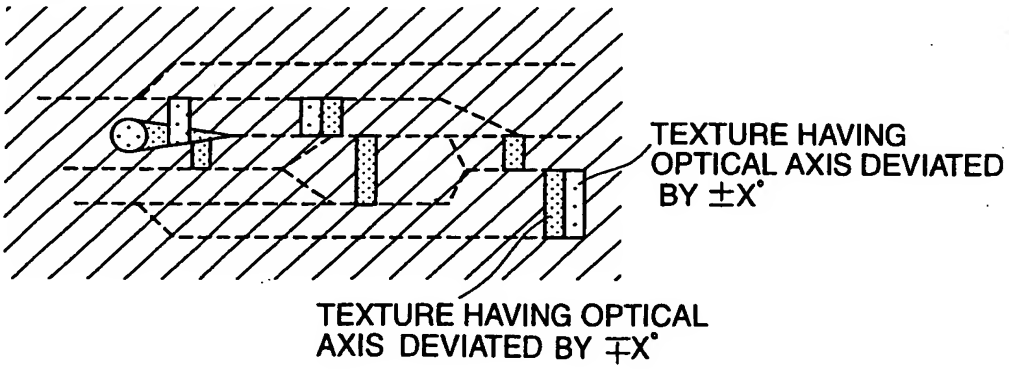
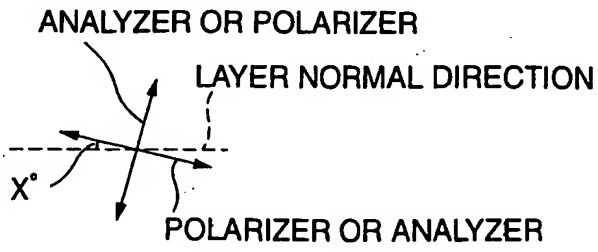



FIG.10D